None.
Objectives

Upon completion of this session, participants should be able to:

- Describe the key components of the APEX care model.
- Apply components of APEX to their clinical setting after discussion of the implementation steps.
- Evaluate similar large-scale clinical transformation projects by applying quality improvement methodology using common clinical and process measures.
The Triple Aim—enhancing patient experience, improving population health, and reducing cost—is accepted as a guiding principle for health care system improvement.¹

Growing recognition of the impact of healthcare workforce burnout on health and patient satisfaction has led to expanding to the Quadruple Aim.²

Team-based care has been shown to improve health care quality and health outcomes and reduce cost.³,⁴

Built upon University of Utah’s Care by Design, the University of Colorado’s APEX model is based on expanded medical assistant roles and MA-to-provider ratios.

University of Utah’s model showed financial sustainability:

- Shifted the bottom line of it’s community clinics from (**$21 million**) to **$244,000** over a 5 year time period
- Generated > **$5 million/month** of downstream gross revenue per month from in network referrals

Background—Issues with the Current State

Which Physicians Are Most Burned Out?

- Critical Care (55%)
- Urology (55%)
- Emergency Medicine (55%)
- Family Medicine (54%)
- Internal Medicine (54%)
- Pediatrics (53%)
- Surgery (51%)
- Ob/Gyn (51%)
- Neurology (51%)
- Radiology (50%)
- Cardiology (50%)
- Anesthesiology (50%)
- Gastroenterology (49%)
- Rheumatology (47%)
- Infectious Disease (47%)
- Nephrology (47%)
- Orthopedics (47%)
- Oncology (46%)
- Pathology (45%)
- Plastic Surgery (45%)
- Pulmonary Medicine (43%)
- Dermatology (43%)
- Diabetes & Endocrinology (41%)
- Ophthalmology (41%)
- Psychiatry & Mental Health (40%)

Background—Issues with the Current State

“To fully satisfy the USPSTF recommendations, 1773 hours of a physician’s annual time, or 7.4 hours per day is needed for the provision of preventive services.”

Yarnall, Pollak, Ostbye, Krause, and Michener. Primary Care: Is there enough time for prevention? Am J Pub Health, v93(4)
Background—Issues with the Current State

(Acute + Chronic + Prevention Care) x Panel = 21.7 hours per day

Background—Issues with the Current State

How do providers spend their day?

What do providers do in the room?

1-2 hours at night

Baseline Clinic Quality Data had room for improvement:

<table>
<thead>
<tr>
<th>Quality Measure</th>
<th>Pre-Go Live Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of pts with colorectal cancer screening up to date</td>
<td>50.3%</td>
</tr>
<tr>
<td>% with blood pressure at goal (&lt;140/90 under 60, &lt;150/90 over 60)</td>
<td>69.9%</td>
</tr>
<tr>
<td>% with mammograms up to date</td>
<td>46%</td>
</tr>
<tr>
<td>% of diabetic pts with A1c &gt;9</td>
<td>18.1%</td>
</tr>
<tr>
<td>Average hours per week providers spend documenting between 7pm and 7am (adjusted by cFTE)</td>
<td>7.5</td>
</tr>
</tbody>
</table>
The APEX Model

- All members Work at Top of Scope
- Improve Patient, Provider, and Staff Satisfaction
- Improve Access
- Improve the Health and Healthcare of Patients and Their Families

Build on culture of QI and Team-Based Care
<table>
<thead>
<tr>
<th>Pre-Visit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New Patient:</strong></td>
<td></td>
</tr>
<tr>
<td>• Conduct New Pt Questionnaire in EPIC</td>
<td></td>
</tr>
<tr>
<td>• Obtain old records</td>
<td></td>
</tr>
<tr>
<td><strong>Established Patient:</strong></td>
<td></td>
</tr>
<tr>
<td>• Pre-visit labs, Outside records</td>
<td></td>
</tr>
<tr>
<td>• Pre-visit assessments (PHQ-9, Medicare Wellness questions, etc.)</td>
<td></td>
</tr>
<tr>
<td>• In-Box management (Refills/PARS, MHC, lab call-backs, etc.)</td>
<td></td>
</tr>
<tr>
<td>• Care management outreach</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Advanced Rooming</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Height and weight</td>
<td></td>
</tr>
<tr>
<td>• Chief complaint, complete agenda, top 2 concerns</td>
<td></td>
</tr>
<tr>
<td>• Allergies/med rec/pharmacy/Pend refills</td>
<td></td>
</tr>
<tr>
<td>• Update Medical/Surgical/Family history, advanced directive</td>
<td></td>
</tr>
<tr>
<td>• Screenings: Fall, suicide, Learning barriers, PHQ2/9, GAD, etc.</td>
<td></td>
</tr>
<tr>
<td>• Identify and act on Care Gaps</td>
<td></td>
</tr>
<tr>
<td>• Take BP &amp; enter vital signs</td>
<td></td>
</tr>
<tr>
<td>• Get necessary equipment (biopsy materials, pap, etc.)</td>
<td></td>
</tr>
<tr>
<td>• Sets agenda with patient</td>
<td></td>
</tr>
<tr>
<td>• Obtain brief templated HPI/ROS (“X-Files”)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In-Room Support</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Documentation support</td>
<td></td>
</tr>
<tr>
<td>• Other “on the fly” support as directed (get team members, complete labs, prepare vaccines, room next patient, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-Provider/Check out</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Review plan and instructions</td>
<td></td>
</tr>
<tr>
<td>• Schedule follow up visits</td>
<td></td>
</tr>
<tr>
<td>• Gives vaccines, performs blood work as needed</td>
<td></td>
</tr>
<tr>
<td>• Escort patient from practice</td>
<td></td>
</tr>
</tbody>
</table>
5 MAs: 2 provider

MA stays with patient during entire clinic visit

MA stays in room to assist with documentation and implementing plan

MA completes post-exam tasks, provides after visit summary
The APEX Model

**Patient 1 Visit**
- Provider 1 sees patient
- MA 2 conducts expanded rooming process
- MA 1 provides in-room documentation support (scribing)
- MA 1 completes post-exam work
- MA 3 manages pod inbox

**Patient 2 Visit**
- Provider 1 sees patient
- MA 2 provides in-room documentation support (scribing)
- MA 2 completes post-exam work
Old Model

Providers manage pod inbox

Inbox

MA 1 conducts quick rooming process

Patient waits

MA 1 completes post-exam work

Provider 1 sees patient

Patient waits

Patient waits

Patient waits

Provider 1 sees patient

MA 1 completes post-exam work
The APEX Model

- Instituted PARTy (Patient Arrival Time – yay)
  - 20 minutes scheduled with MA before provider scheduled time

- Leveled provider schedules

- Decreased visit types that qualified for 40 minute visits

- Changed MA schedules to either 8, 10, or 12 hour shifts

- Staggered lunch schedule for MAs
5/5/2015 visit with Mullen, Rebecca, MD for NEW PATIENT VISIT - EST CARE

Medical History
- **Diagnosis**
  - Musculoskeletal disorder
    - Back and neck
  - Depression
  - Migraines
    - with aura
  - Thyroid disease
    - Had portion of thyroid removed 2/2 mass effect
  - Anxiety
  - Arthritis
  - Unspecified asthma (493.90)
  - Neuromuscular disorder

Surgical History
- **Procedure**
  - THYROID SURGERY
    - Portion of thyroid removed 2/2 mass effect
  - APPENDICOTMY

Gender Identity and Sexual Orientation
- **Questions**
  - What is your current gender?
  - What gender was assigned to you at birth?
  - What is your current sexual orientation?

Healthcare Directive
- **Questions**
  - Healthcare Directive
    - Responses: No
  - Healthcare Directive Info Offered/Provided
    - Responses: Yes
  - Healthcare Directive Info Declined?
  - Type of Healthcare Directive
  - Additional Healthcare Directives
  - Healthcare Directive Contents/Comments
  - Healthcare Decision Maker
  - Healthcare Decision Maker Name/Phone
  - Healthcare Decision Maker #2 Name/Phone
  - If none, then General Contact Name/Phone

Family History
- **Problem**
- **Relation**
- **Age of Onset**
- **Comments**
  - Cancer: Mother
  - Heart disease: Mother
  - Negative History: Brother
  - Negative History: Brother
  - Negative History: Brother
  - Negative History: Sister
  - Negative History: Son
  - Negative History: Son

Substances and Sexuality
- **Smoking Status**
- **Amount**
  - Never Smoker: N/A
  - Smokeless Tobacco Status:
    - Never Used

- **Alcohol Use**
- **Amount**
  - No: N/A

- **Drug Use**
- **Frequency**
  - No: N/A

- **Sexually Active**
- **Partners**
- **Birth Control/Protection**
  - Yes: Male
  - IUD

Assessment:
UPI ASSESS
- Left belly pain
- process due to Miralax
- Increase fiber in Diet?
- Flu in 24 hrs
The APEX Model

- Detailed medication reconciliation:
  - Removes:
    - Patient Reported Meds no longer taking
    - Meds placed in error
    - Duplicate (ie same med, but 2 doses)
    - Therapy completed
    - Old prescriptions (original Rx >12 months)
  - Pends medications needed refilled
**5/5/2015 visit with Shmerling, Alison, MD for RETURN PATIENT EXTENDED - DM visit**

*Images* [References] SmartSet [Media Manager] Print/AS [Review/AS] [Request Outside Records]

### Medications

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>Frequency</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Albuterol HFA 90 mcg actuation inhaler</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood Sugar Diagnostic (One Touch UltraTest)</strong> strip</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BLOOD GLUCOSE METER (ONE TOUCH ULTRA Z)</strong> kit</td>
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</tr>
<tr>
<td><strong>Glucotrol (TENODOS) 0.05% ointment</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Conjugated estrogens (PREMARIN) 0.625 mg vaginal cream</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Dipyridamole (BENADRYL) 25 mg tablet</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Darren</strong></td>
<td></td>
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</tr>
</tbody>
</table>

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**PHARMACY: WAL-MART PHARMACY 2752, COMMERCE CITY, 5990 DAHLIA, CO**

---

**FLAGGED FOR PROVIDER REVIEW WITH PATIENT:** Provider needs to decide if appropriate to remove medication from list. If not appropriate to remove, instruct patient to follow up with his or her prescriber.

- **Alcohol Swabs swab**
  - Apply 1 each topically once as needed.
  - Dsp: 100 each, R-0, No Refill, Last Dose: Not Taking

- **9 ordered Pharmacy: WALGREENS DRUG STORE 01851, DENVER, 7311 E 29TH DR, AT NEC OF QUEBEC & 30TH AVE/MARTIN LUT, CO**
  - Note written 5/6/2015 1334 (Revise trace) (Edit Note)

---

**Assessment and Plan**

1. **HTN, goal below 130/80:**
   - Today BP within goal.

2. **Elevated lipid**
   - Elevation 10/2014:
     - Why I recommend:
       - simvastatin (ZOCOR)
       - Lipid panel: Future.

3. **Urge incontinence**
   - Stable, followed b/c covered sooner.
- Expanded Rooming:
  - Completes orders based on protocol
    - UA
    - HCG
    - Strep
    - A1c
    - Pulse Oximetry
    - Flu vaccine
    - Peak Flows
    - Monofilament exams
    - Adult immunizations

The APEX Model
Expanded rooming:
- Gaps in care
- Orders and pends any test/services overdue based on the Health Maintenance Module in EPIC
  - Lipids
  - DM2 screening
  - Colonoscopy
  - TSH
  - DM tests – A1c, monofilament, microalbumin
  - Immunizations
The APEX Model

- HPI and ROS documentation support
  - Use “xfiles”
    - Preloaded questions and ROS for symptoms or diseases or preventive exams
    - ~250
    - Many adapted from University of Utah
Assessment and Plan:

[UFI ASSESSMENT/PLAN.2103000045]

Subjective:

Patient ID: Angela Test is a 33 y.o., female who presents to University Family Medicine-A.F. Williams for ***

Headaches:

History of Present Illness:
- Description of the headache (dull, throbbing, band-like)??
- History of injury to the head or neck? ***
- Cerebral imaging in the past (CT scan or MRI)? ***
- Headache medications tried in the past: ***
- Photophobia (light hurts eyes)? ***
- Visual aura (spots or flashes of light with headaches)? ***
- Quantity of caffeine use: ***
- Date of last eye exam? ***
- Does the headache wake you up from sleep? ***
- Missing school or work due to headache? ***

Targeted Review of Systems:
- Focal neurologic defects (weakness or numbness)? ***
- Cluster symptoms (nasal congestion or tearing)? ***
The APEX Model

- In-Basket Management
  - All messages (except symptomatic triage calls) go to MAs
  - MA address as much as possible
    - Call pt for more information
    - Pend any orders
    - Draft pt requested letters
  - Then forward to provider as needed for sign offs, additional information, etc.
1st years – MA updates PMSFH

2nd year – MA updates PMSFH and does x-file with ROS

3rd year – Full model – all of the above + in room documentation support (scribing)
Trainees – Med Students

Meet with Student
Discuss Patients and Goals

Provider sees 1st patient, student enters room with MA during rooming of 2nd patient

MA completes rooming and leaves, med student completes H&P (Please allow MA to finish their rooming before asking additional questions)

MA takes over computer, provider does exam, plan discussed - student first, then provider

Provider moves on to patient 3. Student starts process over with patient 4 (Repeat)

If behind have student wait out an additional encounter and read on previous or future patient visit
Implementation

- 2 Pilot Sites:
  - Large Residency site
  - Small Private Practice

- 9 Rapid Improvement Events

- 6 Months of Planning Prior to Go-Live
Implementation

Baseline Data Collected

Post-Intervention Survey Data Collection 1

Post-Intervention Survey Data Collection 2

Partial implementation Short MAs

Full model implementation - In-room support

Go Live!

Ongoing MA Hiring

July 2014

Nov 2014

Feb 2015

May 2015

Nov 2015

May 2016

Nov 2016
Outcomes--
Statistical Process Control Charts

- AKA “Shewhart Charts” or “Statistical Process Control Charts”
- Invented by Walter Shewhart (1891-1967)
  - “Grandfather of Quality Improvement Science”
  - Inventor of “PDSA” method of quality improvement (aka Shewhart Cycle)
- Originally devised for manufacturing in 1920s
- Commonly used in Health Care QI activity

Components:
- Historical population Mean
- Sigma, or Standard deviation of that mean ($\sigma$)
- Control Limits (Mean +/- 3 times the standard deviation)
  - Upper Control Limit (“UCL”) = + 3$\sigma$
  - Lower Control Limit (“LCL”) = - 3$\sigma$

Outcomes—Productivity

# of New Patient Appointments per Month

- NPVs/month
- Pre GoLive mean
- UCL
- LCL

- New Patient Appointments (n)
- 316
- 175
- 326
- 682
- 630

- Dates:
  - 7/1/14
  - 9/1/14
  - 11/1/14
  - 1/1/15
  - 3/1/15
  - 5/1/15
  - 7/1/15
  - 9/1/15
  - 1/1/16
  - 3/1/16
  - 5/1/16
  - 7/1/16
  - 9/1/16
Outcomes—Productivity

Total N of Patients Seen in the Last 13 months
Outcomes—
Access

pre go live mean
UCL
LCL
Outcomes—Access

Median Time to Third Next Available Appointment

- UHCa Primary Care Median
- AFW
- Control1
- Control2

Date: Sep-15 to Oct-16
% of Clinic Population with Colorectal Cancer Screening Up to Date
Quality

Outcomes

% of Clinic Population with Blood Pressure at Goal
(<140/90 for <60, <150/90 for >60)

60% 65% 70% 75% 80% 85%
% of Clinic Population with Mammography Up to Date
Outcomes — Quality

% of Clinic Population with PCV Vaccination Up to Date

- 60%
- 62%
- 64%
- 66%
- 68%
Outcomes—Quality

% with Positive PHQ2→9
Outcomes—Quality

% with Diabetes with BP < 140/90

- 60%
- 65%
- 70%
- 75%
- 80%
- 85%
Outcomes — Quality

% with Diabetes with Foot Exam in the Last 13 Months

- 30%
- 40%
- 50%
- 60%
- 70%
% with Diabetes with Retinal Exam in the Last 13 months
% with Diabetes with A1c > 9

Outcomes—Quality

Outcomes—Quality
Outcomes—Quality

# of Diabetic Patients Seen in the Last 13 months
Outcomes—Quality

cFTE adjusted after hours documentation
Outcomes—Satisfaction

Provider Burnout Score
(Lower = Less Burnout)**

** 1 Question Maslach Burnout Inventory
Outcomes—Global Improvement Capacity

AF Williams (% change from baseline)

Control Residency Practice (% change from baseline)
Outcomes—Finance

[Graph showing financial outcomes over time with labels for pre and post CBD periods.]

AFW: Salary dollars per visit

UCL
Challenges

Success

what people think it looks like

what it really looks like
Challenges

- Growing MA staff
- Training MA’s
- MA skillset
- Provider expectations on rooming
- Learning to e-huddle
- Learning the x-files
- Disruption of the 1 hour whole clinic meeting time d/t staggered lunches
Challenges

- Easy to underestimate
- Providers desire more support, but......
- Changing an MA culture – “I can’t...”
Lessons Learned

- Work together & practice consistently as a team & as units
- Learning new rules, positions and roles can be hard
- It’s a game of yards and inches
- Sometimes you call an audible & change the play
- Great leadership, planners, players, special teams, coaches are all needed to win
- Evaluation is for improvement
- The playbook is thick, the season is long, and championships aren’t won in a single season
- Have perseverance and grit. Celebrate your wins
- Keep your eyes on the prize for victory
I'd do anything to lose 10lbs, except eat healthy and work out.

The Pity Train has just derailed at the corner of Suck It Up & Move On, and crashed into We All Have Problems, before coming to a stop at Get The Hell Over It.
“I was blown away by the service... 0 forms, and 0 time wasted”

“I don't feel like a passive spectator anymore, I'm an integral part of my healthcare team”

“I have never in my 66 years felt so well-cared about and for”
“APEX allows us to work at the highest level”
I can help get patients the care they need.”
“It’s challenging but exciting at the same time.”
“We’re part of the patients care more than ever”
“We’re having fun at work again and the work is done at the end of the day.”
“This new model gives me purpose”
“I don’t have to do it all. Patient interactions are more connected and attentive”

“I barely touch the computer in the room anymore.”

“I’m done with all my notes by 5:30 or 6:00. That’s never happened before”

“It’s been a game-changer...it allows me to stay in practice and be happy.”

“APEX has changed my life.”
Please evaluate this presentation using the conference mobile app! Simply click on the "clipboard" icon on the presentation page.
Questions?